WHAT IS CLAIMED IS:

Sub A7

1. A control apparatus for numerical control adapted for a cutting machine having a turret which can be turned to an arbitrary position, wherein

an X-axis offset value ($\triangle$X) and a Z-axis offset value ($\triangle$Z) of a cutting edge of a cutting tool on coordinates with respect to said cutting machine are calculated in accordance with a turning angle of said turret, and

said X-axis offset value and said Z-axis offset value are indicated on a display.

2. A control apparatus according to claim 1, wherein an X-axis wear compensation value ($\triangle$Xt) and a Z-axis wear compensation value ($\triangle$Zt) are indicated in relation to said X-axis offset value ($\triangle$X) and said Z-axis offset value ($\triangle$Z).

3. A control apparatus according to claim 1, wherein when said turret is turned to a turning angle (α), an X-axis value of the tool (L2), a Z-axis value of the tool (L1), an X-axis value of the turret (L4) and a Z-axis value of the turret (L3) are converted according to the following equations to calculate said X-axis offset value ($\triangle$X) and said Z-axis offset value ($\triangle$

Z).

$$\Delta X = (\Delta Az \cdot \cos\alpha - \Delta Ax \cdot \sin\alpha) \times 2 \quad \text{(Equation 1)}$$

$$\Delta Ax = L2 + L4$$

$$\Delta Az = L1 + L3$$

$$\Delta Z = -\Delta Az \cdot \sin\alpha - \Delta Ax \cdot \cos\alpha \quad \text{(Equation 2)}$$

4. A control apparatus according to claim 2, wherein when said turret is turned to a turning angle (α), an X-axis value of the tool (L2), a Z-axis value of the tool (L1), an X-axis value of the turret (L4) and a Z-axis value of the turret (L3) are converted according to the following equations to calculate said X-axis offset value (ΔX) and said Z-axis offset value (ΔZ).

$$\Delta X = (\Delta Az \cdot \cos\alpha - \Delta Ax \cdot \sin\alpha) \times 2 \quad \text{(Equation 1)}$$

$$\Delta Ax = L2 + L4$$

$$\Delta Az = L1 + L3$$

$$\Delta Z = -\Delta Az \cdot \sin\alpha - \Delta Ax \cdot \cos\alpha \quad \text{(Equation 2)}$$

5. A control apparatus according to any one of claims 1 through 4, wherein said cutting tool can be rotated around the tool axis to an arbitrary position,

an X-axis value (L2r) of said cutting edge of said cutting tool after a rotation of said cutting tool with a rotation angle (β) is calculated according to the

equation of $L2r = L2 \cdot \cos\beta$,

said X-axis offset value and said Z-axis offset value when said turret is turned to a turning angle (α) are calculated according to the following equations 3 and 4, and

said X-axis offset value ($\triangle Xr$) after the rotation of said cutting tool and said Z-axis offset value ($\triangle Zr$) after the rotation of said cutting tool are indicated on said display.

$$\triangle Xr = (\triangle Az \cdot \cos\alpha - \triangle Axr \cdot \sin\alpha) \times 2 \quad \text{(Equation 3)}$$

$$\triangle Axr = L2 + L4$$

$$\triangle Az = L1 + L3$$

$$\triangle Zr = -\triangle Az \cdot \sin\alpha - \triangle Axr \cdot \cos\alpha \quad \text{(Equation 4)}$$

6. A method of indicating an X-axis offset value ($\triangle X$) and a Z-axis offset value ($\triangle Z$) of a cutting edge of a cutting tool, in a control apparatus for a cutting machine having a turret which can be turned to an arbitrary position, said method comprising the steps of:

reading an X-axis value of the tool (L2) and a Z-axis value of the tool (L1) of the selected cutting tool;

reading an X-axis value of the turret (L4);

storing a Z-axis value of the turret (L3) in

memory;

reading a turning angle (α) of said turret;

calculating said X-axis offset value ($\triangle X$) and said Z-axis offset value ($\triangle Z$) according to the following equations 1 and 2, employing said X-axis value of the tool (L2), said Z-axis value of the tool (L1), said X-axis value of the turret (L4) and said Z-axis value of the turret (L3); and

indicating said X-axis offset value ($\triangle X$) and said Z-axis offset value ($\triangle Z$).

$$\triangle X = (\triangle Az \cdot \cos\alpha - \triangle Ax \cdot \sin\alpha) \times 2 \quad \text{(Equation 1)}$$

$$\triangle Ax = L2 + L4$$

$$\triangle Az = L1 + L3$$

$$\triangle Z = -\triangle Az \cdot \sin\alpha - \triangle Ax \cdot \cos\alpha \quad \text{(Equation 2)}$$

7. A control apparatus for numerical control adapted for a cutting machine in which a cutting tool is rotated around the tool axis thereof to an arbitrary position, wherein an X-axis value (L2r) of a cutting edge of said cutting tool on a coordinate with respect to said cutting machine is calculated in accordance with a rotation angle of said cutting tool,

an X-axis offset value ($\triangle Xr$) after the rotation is obtained from the following equations employing said X-axis value of the tool (L2r) and an X-axis value of

the turret (L4), and

said X-axis offset value ($\triangle Xr$) after the rotation is indicated on a display.

$$\triangle Xr = \triangle Axr \times 2$$

$$\triangle Axr = L2r + L4$$

8. A control apparatus for numerical control adapted for a cutting machine in which a cutting tool is rotated around the tool axis to an arbitrary position, wherein a Y-axis offset value ($\triangle Y$) of a cutting edge of said cutting tool on a coordinate with respective to said cutting machine is calculated in accordance with a rotation angle of said cutting tool, and said Y-axis offset value is indicated on a display.

9. A control apparatus according to claim 7 or 8, wherein a Y-axis offset value ($\triangle Y$) of said cutting edge of said cutting tool on coordinates with respective to said cutting machine is calculated in accordance with the rotation angle of said cutting tool, and

an X-axis wear compensation value ($\triangle Xt$) and a Y-axis wear compensation value ($\triangle Yt$) are indicated in relation to said X-axis offset value ($\triangle Xr$) after the rotation and said Y-axis offset value ($\triangle Y$).